The documentation and process conversion measures necessary to comply with this amendment shall be completed by 23 May, 2001.

INCH-POUND

MIL-PRF-19500/439E
23 February 2001
SUPERSEDING
MIL-S-19500/439D
24 February 1995

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, HIGH-POWER
TYPES 2N5038 AND 2N5039, JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the performance requirements for NPN silicon, high-power transistors for use in high-speed power-switching applications. Four levels of product assurance are provided for each encapsulated device type as specified in MIL-PRF-19500, and two levels of product assurence are provided for each unencapsulated device type.

1.2 Physical dimensions. See figure 1 (T0-3) and figure 2 (JANHC and JANKC).

1.3 Maximum ratings.

	P_T at T_C = +25°C (1)	V_{CBO}	V_{CEO}	V_{EBO}	I_B	I_C	T_{STG} and T_{OP}
	W	V dc	V dc	V dc	V dc	A dc	°C
2N5038	140	150	90	7.0	5	20	-65 to +200
2N5039	140	125	75	7.0	5	20	-65 to +200

(1) Derate linearly 800 mW/°C for T_A > +25°C.

1.4 Primary electrical characteristics at T_A = +25°C.

Limit	h_{FE3} (1) V_{CE} = 5.0 V dc I_C = 12 A dc (2N5038) I_C = 10 A dc (2N5039)	$\|h_{fe}\|$ V_{CE} = 10 Vdc I_C = 2.0 A dc f = 5 MHz	$V_{CE(set)1}$ (1) I_C = 12 A dc I_B = 1.2 A dc (2N5038) I_C = 10 A dc I_B = 1.0 A dc (2N5039)	C_{obo} V_{CB} = 10 Vdc I_C = 0 100 kHz ≤ f ≤ 1MHz	Pulse Response		$R_{\Theta JC}$
					t_{on}	t_{off}	
			V dc	pf	µs	µs	°C/W
Min	20	12					
Max		48	1.0	500	0.5	2.0	1.25

(1) Pulsed (see 4.5.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC-VAC, Post Office Box 3990, Columbus, OH 43216-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-19500 - Semiconductor Devices, General Specification for.

STANDARD

DEPARTMENT OF DEFENSE

MIL-STD-750 - Test Methods for Semiconductor Devices.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Document Automation Production Services (DAPS), Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. The requirements for acquiring the product described herein shall consist of this document and MIL-PRF-19500.

3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturer's list (QML) before contract award (see 4.2 and 6.3).

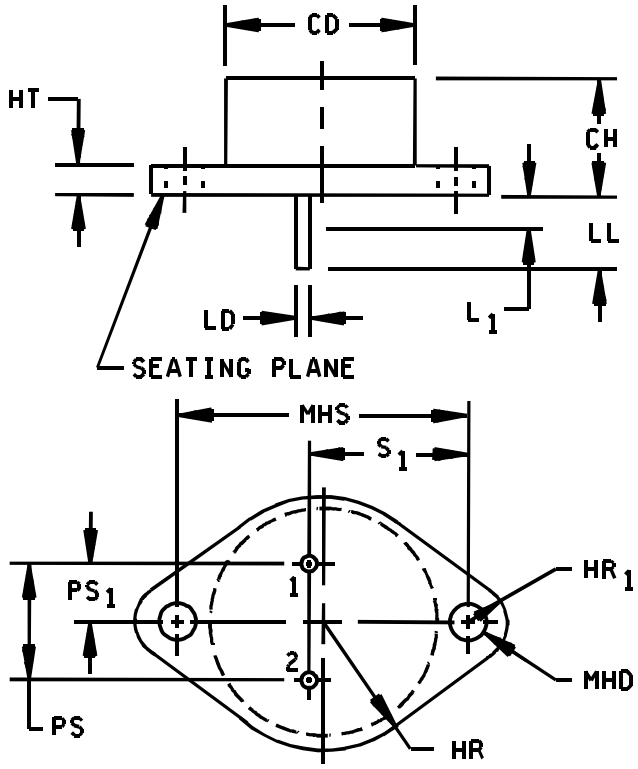
3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

3.4 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-19500 and figures 1 and 2 herein.

3.4.1 Lead finish. Unless otherwise specified, lead finish shall be solderable in accordance with MIL-PRF-19500, MIL-STD-750, and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see 6.2).

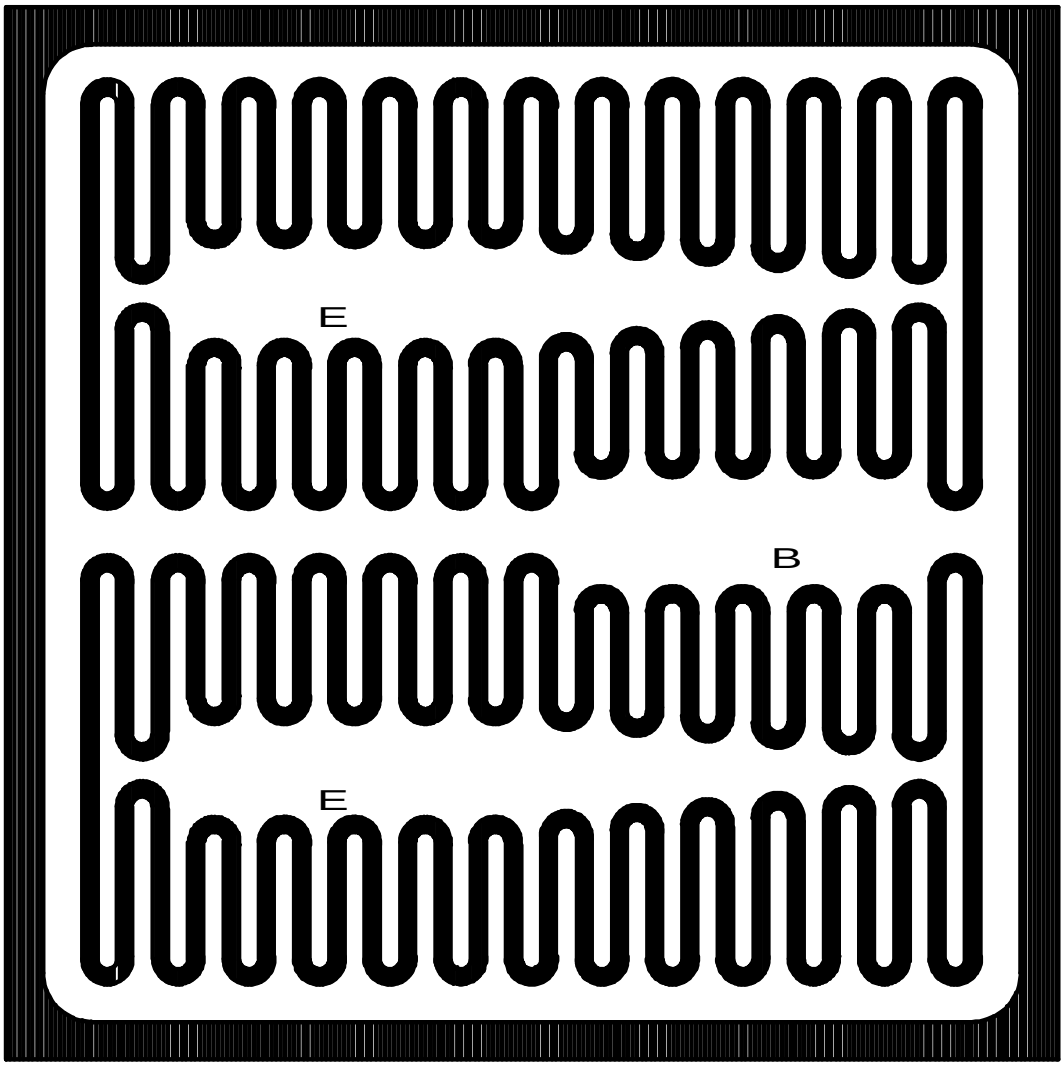
3.5 Marking. Marking shall be in accordance with MIL-PRF-19500. At the option of the manufacturer, marking may be omitted from the body, but shall be retained on the initial container.

Symbol	Dimension				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	- - -	.875	- - -	22.22	
CH	.270	.380	6.86	9.65	
HR	.495	.525	12.57	13.33	4
HR_1	.131	.188	3.33	4.78	4
HT	.060	.135	1.52	3.43	
LD	.038	.053	0.97	1.35	4, 6
LL	.312	.500	7.92	12.70	
L_1	- - -	.050	- - -	1.27	6
MHD	.151	.165	3.84	4.19	4
MHS	1.177	1.197	29.90	30.40	
PS	.420	.440	10.67	11.18	3
PS_1	.205	.225	5.21	5.72	3
S_1	.655	.675	16.64	17.15	
Notes	1, 2, ,5, 7		1, 2, ,5, 7		



NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. These dimensions should be measured at points .050 - .055 inch (1.27 mm - 1.40 mm) below seating plane. When gauge is not used, measurement will be made at seating plane.
4. Two places.
5. The seating plane of the header shall be flat within .001 inch (0.03 mm) inside a .930 inch (23.62 mm) diameter circle on the center of the header and flat within .001 inch (0.03 mm) concave to .006 inch (0.15 mm) convex overall.
6. Lead diameter shall not exceed twice LD within L_1.
7. Terminal 1 is base; terminal 2 is emitter; case is collector.

FIGURE 1. Physical dimensions, (similar to TO-3).



NOTES:

1. Chip size: .180 X .180 inches ±.002 inch.
2. Chip thickness: .005 to .009 inch.
3. Top metal: Aluminum 40,000 Å min, 50,000 Å nominal.
4. Back metal: Gold 2,500 Å min, 3,000 Å nominal.
5. Backside: Collector.
6. Bonding pad: B = .017 X .060 inches ±.002 inches, E = .017 X .070 inches ±.002 inches.

FIGURE 2. JANHC and JANKC (A-version die dimensions).

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I herein.

3.7 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table I.

3.8 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Screening (see 4.3).

c. Conformance inspection (see 4.4).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.3 Screening (JANTXV and JANTX levels). Screening shall be in accordance with table IV of MIL-PRF19500 and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see table IV of MIL-PRF-19500)	Measurement	
	JANS	JANTX and JANTXV levels
9	I_{CEX1}, h_{FE2}, and h_{FE3}	I_{CEX1}
11	I_{CEX1}, h_{FE2}, and h_{FE3}; ΔI_{CEX1} = 100 percent of initial value or 1 µA dc, whichever is greater; Δh_{FE3} = ±20 percent of the initial value.	I_{CEX1}, h_{FE2}, and h_{FE3}; ΔI_{CEX1} = 100 percent of initial value or 1 µA dc, whichever is greater.
12	See 4.3.1	See 4.3.1
13	Subgroup 2 and 3 of table I herein; ΔI_{CEX1} = 100 percent of initial value or 1 µA dc, whichever is greater; Δh_{FE3} = ±20 percent of initial value.	Subgroup 2 of table I herein; ΔI_{CEX1} = 100 percent of initial value or 1 µA dc, whichever is greater; Δh_{FE3} = ±20 percent of initial value.

4.3.1 Power burn-in conditions. Power burn-in conditions are as follows: T_J = +187.5°C ±12.5°C; V_{CB} = 60 V dc ±5 V dc; $T_A \leq$ +100°C

4.3.2 Screening (JANHC and JANKC). Screening of JANHC and JANKC die shall be in accordance with MIL-PRF-19500.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500 and table I herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VIb (JANTX, and JANTXV) of MIL-PRF-19500 and as follows. Electrical measurements (end-points) shall be in accordance with table I, subgroup 2 herein. Delta requirement shall be in accordance with 4.5.3 herein.

4.4.2.1 Group B inspection, table VIb (JANS) of MIL-PRF-19500.

Subgroup	Method	Condition
B3	2037	Test condition A.
B3	1037	2,000 cycles; V_{CB} = 10 V dc; ΔT_J between cycles ≥ = +100°C; $T_{on} = T_{off} \geq 1$ minute.
B5	1027	$V_{CE} \geq 20$ V dc; P_T = 80 W at T_C = +100°C or adjusted as required by the chosen T_C to give an average lot T_J = +225°C.
B7	3053	Load condition C; (unclamped inductive load) (see figure 7); T_C = +25°C; duty cycle ≤ 10%; $R_s = 0.1\Omega$; $t_r = t_p \leq 500$ns, for qualification and large lot QCI, sample size = 22, c = 0; for small lot QCI, sample size = 6, c = 0. TEST 1: t_p = 5 ms (vary to obtain I_C); $R_{BB1} = 2\Omega$; V_{BB1} = 10 V dc; $R_{BB2} = 20\Omega$; V_{BB2} = 4 V dc; V_{CC} = 10 V dc; I_C = 20 A; L = 70 µH, 0.1Ω. TEST 2: t_p = 5 ms (vary to obtain I_C); $R_{BB1} = 40\Omega$; V_{BB1} = 10 V dc; $R_{BB2} = 20\Omega$; V_{BB2} = 4 V dc; V_{CC} = 10 V dc; I_C = 4.5 A; L = 500 µH, 0.1Ω.

4.4.2.2 Group B inspection, (JAN, JANTX, and JANTXV). Electrical endpoints shall be in accordance with group A, subgroup 2, herein.

Subgroup	Method	Condition
B3	2037	Test condition A
B3	1037	2,000 cycles; V_{CB} = 10 V dc; ΔT_J between cycles ≥ +100°C; $t_{on} = t_{off} \geq 1$ minute
B7	3053	Load condition C; (unclamped inductive load) (see figure 7); T_C = +25°C; duty cycle ≤ 10%; $R_s = 0.1\Omega$; $t_r = t_p \leq 500$ns, for qualification and large lot QCI, sample size = 22, c = 0; for small lot QCI, sample size = 6, c = 0. TEST 1: t_p = 5 ms (vary to obtain I_C); $R_{BB1} = 2\Omega$; V_{BB1} = 10 V dc; $R_{BB2} = 20\Omega$; V_{BB2} = 4 V dc; V_{CC} = 10 V dc; I_C = 20 A; L = 70 µH, 0.1Ω. TEST 2: t_p = 5 ms (vary to obtain I_C); $R_{BB1} = 40\Omega$; V_{BB1} = 10 V dc; $R_{BB2} = 20\Omega$; V_{BB2} = 4 V dc; V_{CC} = 10 V dc; I_C = 4.5 A; L = 500 µH, 0.1Ω.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500 and as follows. Electrical measurements (end-points) and delta shall be in accordance with table I, group A, subgroup 2. Delta requirements shall be in accordance with 4.5.3 herein.

4.4.3.1 Group C inspection, table VII of MIL-PRF-19500.

Subgroup	Method	Condition
C2	1056	Test condition B.
C2	2036	Test condition A, weight = 10 lbs., t = 15 s.
C6	1027	6,000 cycles; V_{CB} = 10 V dc; ΔT_J between cycles ≥ +100°C; $t_{on} = t_{off} \geq 1$ minute.

4.5 Method of inspection. Methods of inspection shall be as specified in the appropriate tables and as follows.

4.5.1 Pulse measurements. Conditions for pulse measurement shall be as specified in section 4 of MIL-STD-750.

4.5.2 Thermal resistance. Thermal resistance measurements shall be performed in accordance with method 3131 of MIL-STD-750. The following details shall apply:

a. I_M measurement ..... 2 A.

b. V_{CE} measurement voltage..... 20 V.

c. I_H collector heating current..... 2.6 A (minimum).

d. V_H collector emitter heating voltage.....20 V (minimum).

e. t_H heating time ..... Steady-state (see MIL-STD-750, method 3131).

f. t_{MD} measurement delay time.....20 µs.

g. t_{SW} sample window time .....10 µs maximum.

The maximum limit for $R_{\theta JC}$ shall be 1.25°C/W.

4.5.3 Delta requirements. Delta requirements shall be as specified below:

Step	Inspection (1) (2) (3) (4)	MIL-STD-750		Symbol	Limit		Unit
		Method	Conditions		Min	Max	
1	Collector to emitter voltage (saturated) 2N5038 2N5039	3071	 I_C = 12 A dc, I_B = 1.2 A dc I_C = 10 A dc, I_B = 1.0 A dc	$\Delta V_{CE(sat)1}$	50 mV dc change from initial value.		
2	Collector to emitter cutoff current 2N5038 2N5039	3041	Bias condition A; V_{BE} = -1.5 V dc V_{CE} = 100 V dc V_{CE} = 85 V dc	ΔI_{CEX1}	100 percent of initial value or 1μA dc, whichever is greater.		
3	Forward-current transfer ratio 2N5038 2N5039	3076	V_{CE} = 5.0 V dc; I_C = 12 A dc I_C = 10 A dc	Δh_{FE3}	±25 percent change from initial value.		

1/ Devices which exceed the group A limits for this test shall not be acceptable.
2/ The electrical measurements for table IVa (JANS) of MIL-PRF-19500 are as follows:
   a. Subgroup 4, see step 1 above.
   b. Subgroup 5, see steps 1, 2, and 3 above.
3/ The electrical measurements for table IVb, (JAN, JANTX and JANTXV) of MIL-PRF-19500 are as follows: Subgroups 3 and 6, see step 3 above.
4/ The electrical measurements for table V of MIL-PRF-19500 are as follows: Subgroup 6, see steps 1, 2, and 3 (JANS) above and step 3 (JAN, JANTX, and JANTXV) above.

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 1						
Visual and mechanical examination	2071					
Subgroup 2						
Breakdown voltage, collector to emitter	3011	Bias condition D, I_C = 200 mA dc, pulsed (see 4.5.1),	$V_{(BR)CEO}$			
2N5038				90		V dc
2N5039				75		V dc
Collector-emitter cutoff current	3041	Bias condition D	I_{CEO}			
					1	µA dc
2N5038		V_{CE} = 70 V dc			1	µA dc
2N5039		V_{CE} = 55 V dc				
Emitter to base cutoff current	3061	Bias condition D, V_{EB} = 5.0 V dc	I_{EBO}		1	µA dc
Collector-emitter cutoff current	3041	Bias condition A, V_{BE} = -1.5 V dc	I_{CEX1}			
2N5038		V_{CE} = 100 V dc			5	µA dc
2N5039		V_{CE} = 85 V dc			5	µA dc
Collector to base cutoff current	3036	Bias condition D,	I_{CBO}			
2N5038		V_{CE} = 150 V dc			1	µA dc
2N5039		V_{CE} = 125 V dc			1	µA dc
Breakdown voltage, emitter to base	3026	Bias condition D, I_E = 25 mA dc	$V_{(BR)EBO}$	7.0		V dc
Base to emitter voltage (nonsaturated)	3066	Test condition B, V_{CE} = 5 V dc; pulsed (see 4.5.1).	V_{BE}			
2N5038		I_C = 12 A dc			1.8	V dc
2N5039		I_C = 10 A dc			1.8	V dc
Base to emitter voltage (saturated)	3066	Test condition A, I_C = 20 A dc; I_B = 5 A dc	$V_{BE(sat)}$		3.3	V dc
Collector to emitter voltage (saturated)	3071	Pulsed (see 4.5.1)	$V_{CE(sat)1}$			
2N5038		I_C = 12 A dc, I_B = 1.2 A dc			1.0	V dc
2N5039		I_C = 10 A dc, I_B = 1.0 A dc			1.0	V dc

See footnote at end of table.

TABLE I. Group A inspection - Continued.

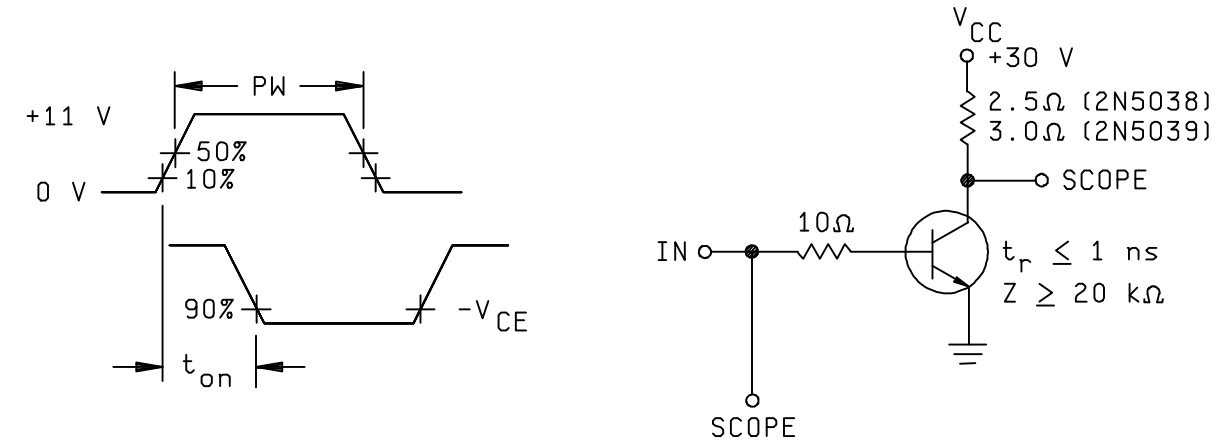
Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 2 - Continued						
Collector to emitter voltage (saturated)	3071	I_C = 20 A dc, I_B = 5.0 A dc; pulsed (see 4.5.1)	$V_{CE(sat)2}$		2.5	V dc
Forward-current transfer ratio	3076	V_{CE} = 5 V dc; I_C = 0.5 A dc; pulsed (see 4.5.1)	h_{FE1}			
2N5038				50		
2N5039				30		
Forward current transfer ratio	3076	V_{CE} = 5 V dc; I_C = 2.0 A dc; pulsed (see 4.5.1)	h_{FE2}			
2N5038				50	200	
2N5039				30	150	
Forward current transfer ratio	3076	V_{CE} = 5 V dc; pulsed (see 4.5.1)	h_{FE3}			
2N5038		I_C = 12 A dc		15		
2N5039		I_C = 10 A dc		15		
Subgroup 3						
High temperature operation:		T_A = +150°C				
Collector to emitter cutoff current	3041	Bias condition A, V_{BE} = -1.5 V dc	I_{CEX2}			
2N5038		V_{CE} = 100 V dc			100	µA dc
2N5039		V_{CE} = 85 V dc			100	µA dc
Low temperature operation:		T_A = -55°C				
Forward-current transfer ratio	3076	V_{CE} = 5 V dc; pulsed (see 4.5.1),	h_{FE4}			
2N5038		I_C = 12 A dc		10		
2N5039		I_C = 10 A dc		10		
Subgroup 4						
Magnitude small-signal short-circuit forward-current transfer ratio	3306	V_{CE} = 10 V dc; I_C = 2 A dc; f = 5 MHz	$\lvert h_{FE} \rvert$	12	48	
Open circuit output capacitance	3236	V_{CB} = 10 V dc; I_E = 0 A dc; 100 kHz ≤ f ≤ 1 MHz	C_{obo}		500	pF

See footnote at end of table.

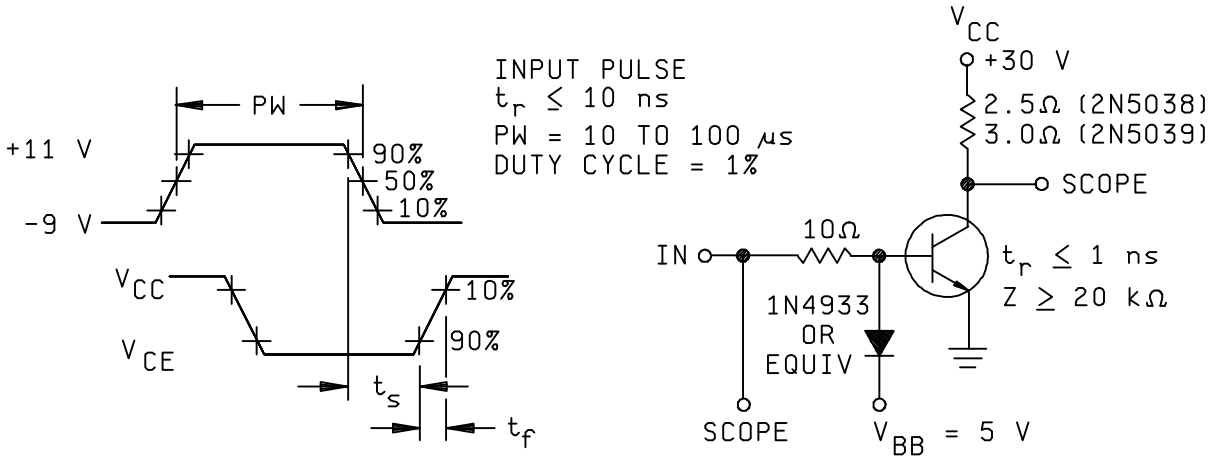
TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
Subgroup 4 - Continued						
Pulse response transfer ratio	3251	Test condition A except test circuit and pulse requirements in accordance with figure 3 herein.				
Turn on time		V_{CC} = 30 V dc	t_{on}			
2N5038		I_C = 12 A dc, I_{B1} = 1.2 A dc			0.5	µs
2N5039		I_C = 10 A dc, I_{B1} = 1.0 A dc			0.5	µs
Turn off time		V_{CC} = 30 V dc	t_{off}			
2N5038		I_C = 12 A dc, I_{B1} = -I_{B2} = 1.2 A dc			2.0	µs
2N5039		I_C = 10 A dc, I_{B1} = -I_{B2} = 1 A dc			2.0	µs
Subgroup 5						
Safe operating area (dc operation)	3051	T_C = +25°C, t = 1 s, 1 cycle, see figure 4				
Test 1		I_C = 5 A dc V_{CE} = 28 V dc				
Test 2		I_C = 0.9 A dc V_{CE} = 45 V dc				
Test 3		I_C = 20 A dc V_{CE} = 7.0 V dc				
Test 4 (2N5038 only)		I_C = 0.23 A dc V_{CE} = 90 V dc				
Test 5 (2N5039 only)		I_C = 0.32 A dc V_{CE} = 75 V dc				
Safe operating area (clamped switching)	3053	T_C = +25°C, I_C = 20 A dc; (see figures 5 and 6)				
2N5038		Clamp voltage = 90 V dc				
2N5039		Clamp voltage = 75 V dc				
		(Device fails if clamp voltage is not reached)				
Electrical measurements		See 4.5.3, steps 1 and 3				
Subgroup 6 and 7						
Not applicable						

1/ For sampling plan, see MIL-PRF-19500.



TURN-ON (t_{on}) TIME TEST CIRCUIT



TURN-ON (t_{off}) TIME TEST CIRCUIT

FIGURE 3. Switching time test circuits.

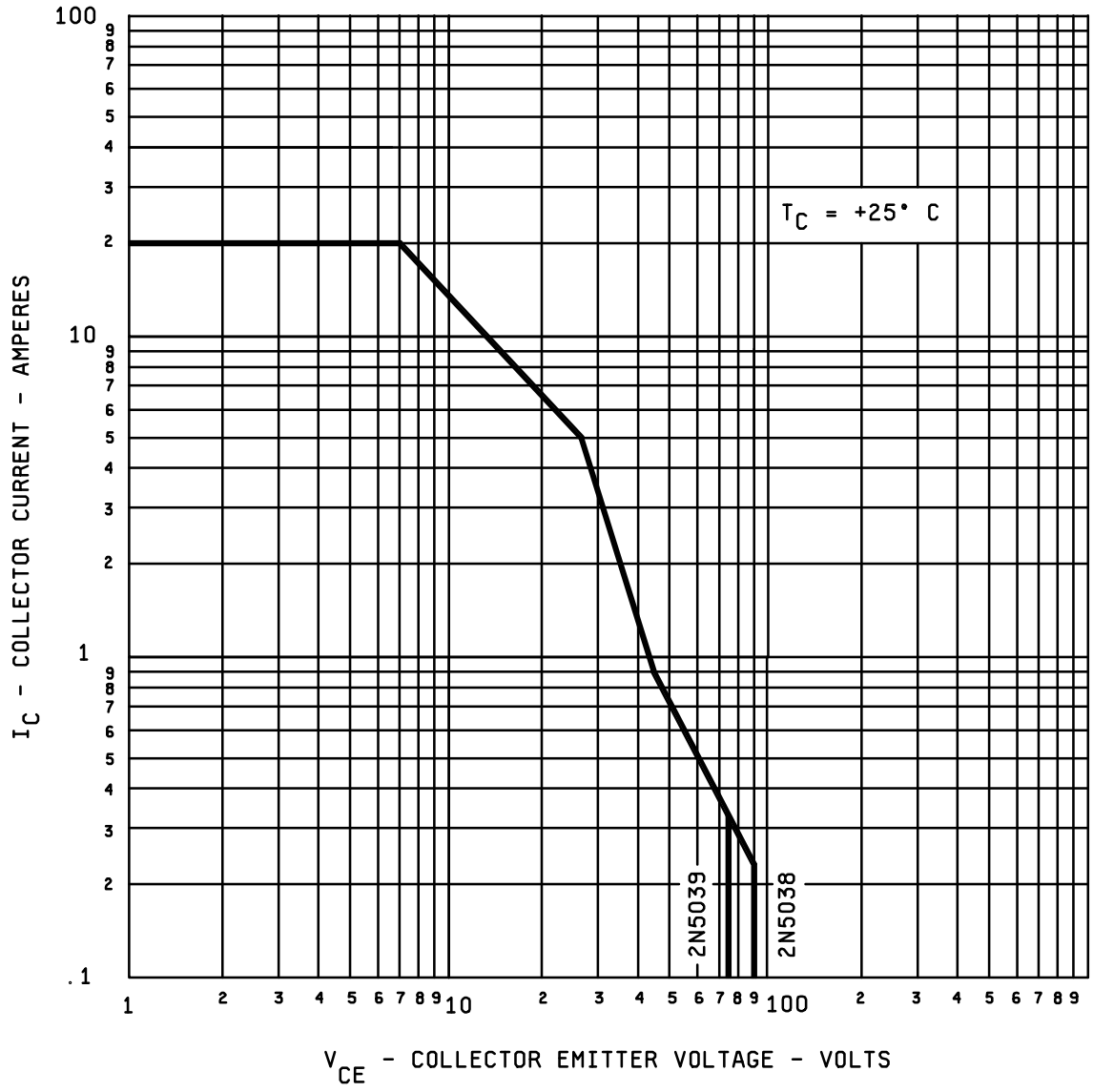


FIGURE 4. Maximum safe operating area graph (continuous dc).

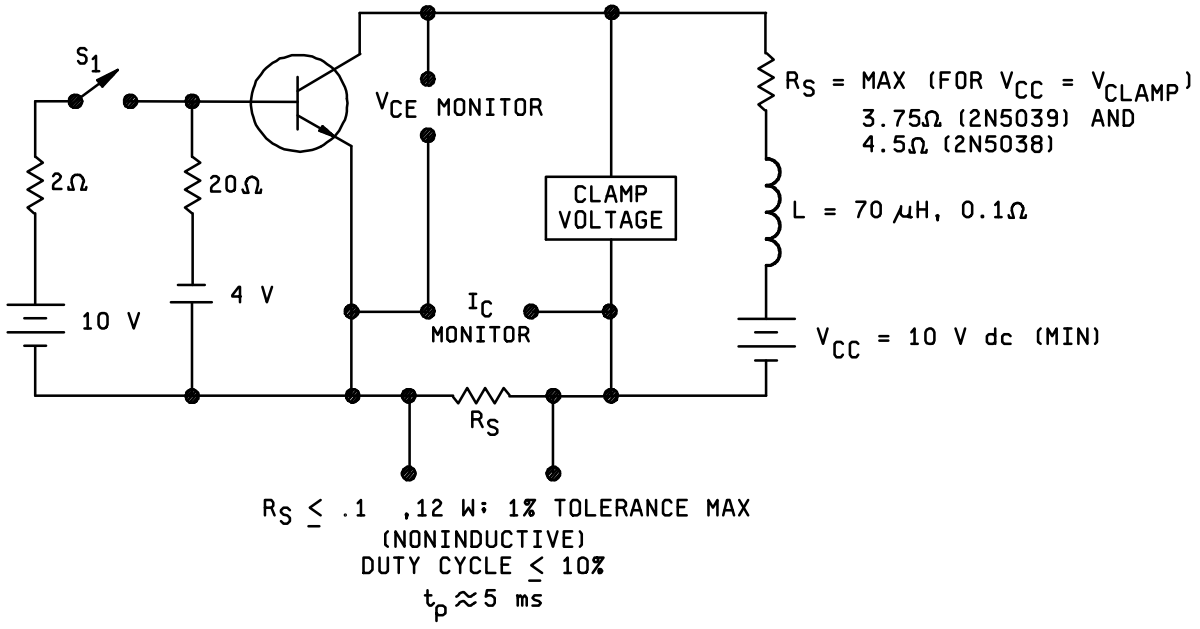


FIGURE 5. Clamped inductive sweep test circuit.

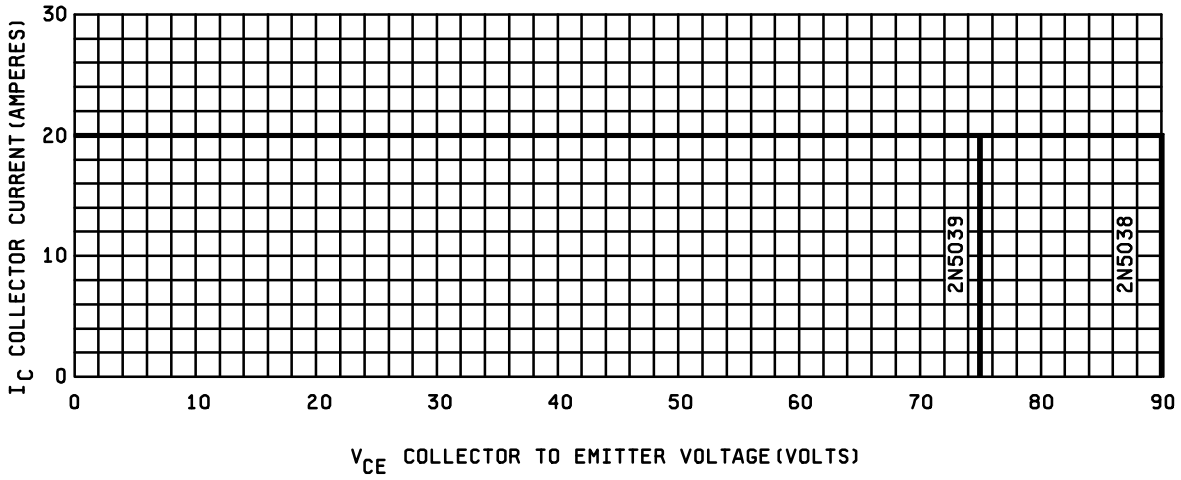


FIGURE 6. Safe operating area for switching between saturation and cutoff - clamped inductive load.

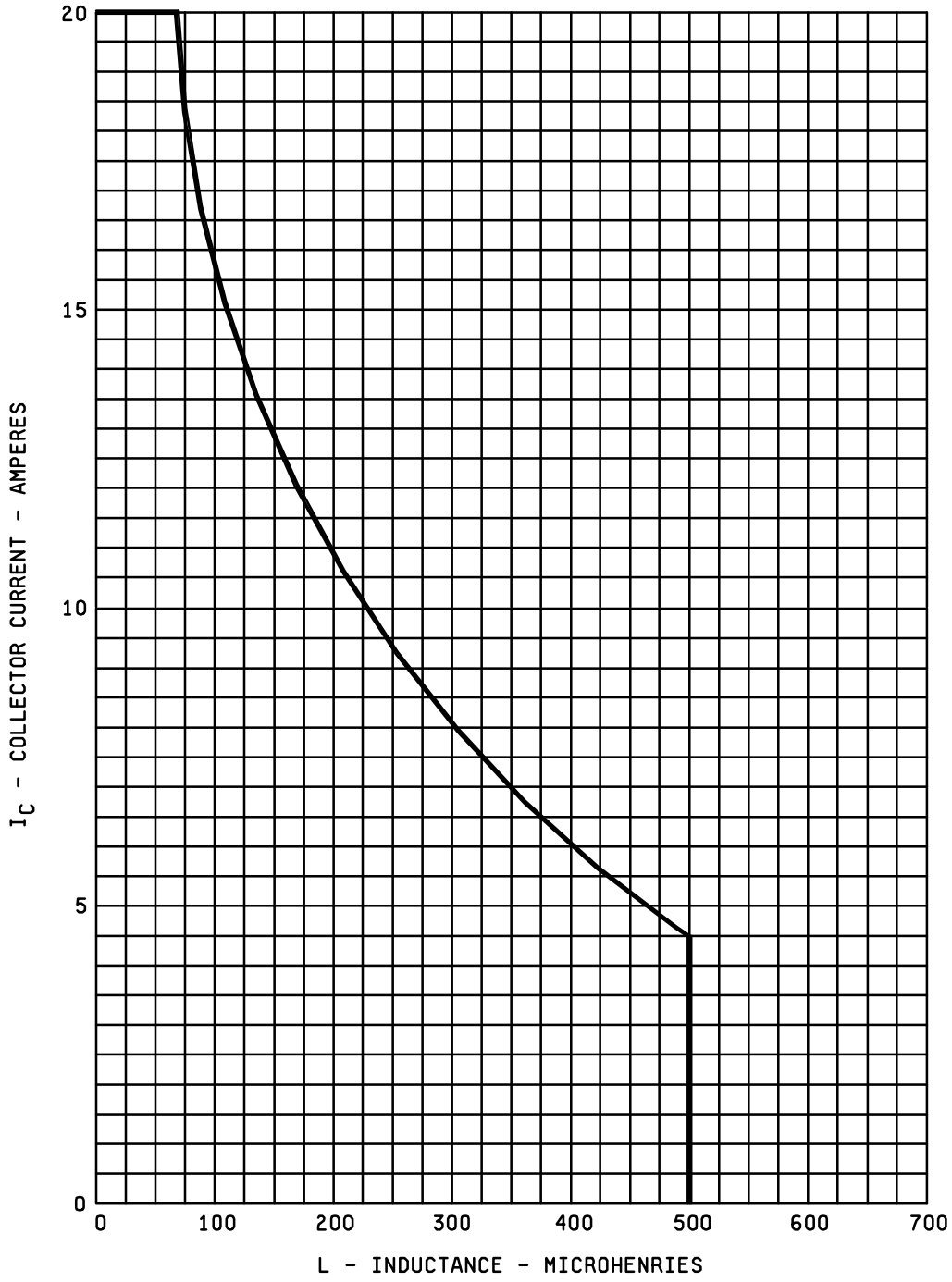


FIGURE 7. Safe operating area for switching between saturation and cutoff - unclamped inductive load.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Points' packaging activity within the Military Department or Defense Agency, or within the Military Departments' System Command. Packaging data retrieval is available from the managing Military Departments' or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The notes specified in MIL-PRF-19500 are applicable to this specification.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.

b. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2).

c. Lead formation and finish may be specified (see 3.4.1).

d. Type designation and product assurance level.

e. For die acquisition, the JANHC or JANKC letter version shall be specified (see figure 2).

f. Surface mount designation if applicable.

g. Packaging requirements (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List (QML-19500) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center, Columbus, ATTN: DSCC-VQE, Post Office Box 3990, Columbus, OH 43216-5000.

6.4 Suppliers of JANHC and JANKC die. The qualified JANHC and JANKC suppliers with the applicable letter version (example JANHCA2N5038) will be identified on the QPL.

Die ordering information			
PIN	Manufacturer		
	33178		
2N5038 2N5039	JANHCA2N5038 JANHCA2N5039		
2N5038 2N5039	JANKCA2N5038 JANKCA2N5039		

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - CR
Navy - EC
Air Force - 11
NASA - NA
DLA - CC

Review activities:
Army - MI, SM
Navy - AS, CG, MC
Air Force - 13, 19, 99

Preparing activity:
DLA - CC

(Project 5961-2161)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-19500/439E	2. DOCUMENT DATE 23 February 2001

3. **DOCUMENT TITLE**
SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, HIGH-POWER TYPES 2N5038 AND 2N5039, JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) COMMERCIAL DSN FAX EMAIL	7. DATE SUBMITTED

8. PREPARING ACTIVITY

a. Point of Contact Alan Barone	b. TELEPHONE Commercial 614-692-0510	DSN 850-0510	FAX 614-692-6939	EMAIL alan_barone@dscc.dla.mil
c. ADDRESS Defense Supply Center Columbus ATTN: DSCC-VAC P.O. Box 3990 Columbus, OH 43216-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman, Suite 2533 Fort Belvoir, VA 22060-6221 Telephone (703) 767-6888 DSN 427-6888			